

# Nitrous Oxide *focus group*

## Overview

The Nitrous Oxide Focus Group is a consortium-based research initiative established to explore the action of the greenhouse gas nitrous oxide ( $N_2O$ ).

The Focus Group, led by Professor David Richardson of the University of East Anglia, is at the centre of a diverse scientific community, drawing on expertise of computer scientists, biologists, soil scientists, microbiologists, chemists and environmental scientists from a number of UK academic institutions.

The multi-disciplinary team of scientists aims to understand the sources of this potent greenhouse gas, the chemistry and biology behind its production, its overall impact upon climate change and ultimately to develop techniques to mitigate its effect. The Focus Group will work toward solutions for the wider community and commercial partners are being sought to inform and enable the development of opportunities arising from the group's research.

Understanding the factors that affect the emission of this potent gas will be of great benefit to a range of industries including food and farming, transport and fuels, waste management, environmental (or conservation) management and climate change.



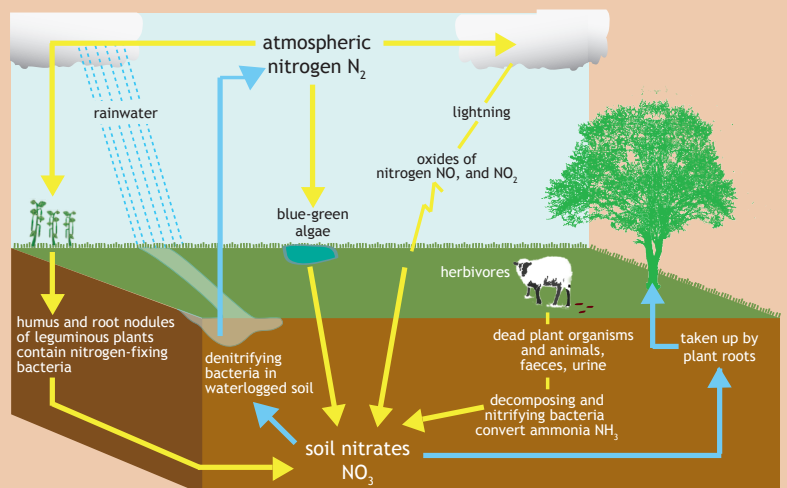
## Strategic Objectives

- Bridge the gap between knowledge and practice - translating what scientists know to meet the needs of what users need to know
- Develop a greater understanding of the science around  $N_2O$  to help influence policy makers
- Consider  $N_2O$  in the context of agriculture, energy, water treatment and transport
- Develop an understanding of how to mitigate nitrous oxide emissions and develop best practice on communicating advice
- Identify the key emission variables - such as fertilizer application, soil type and weather
- Identify future opportunities and threats



## Nitrous Oxide: facts and figures

- 300 times more global warming potential than carbon dioxide
- 300 times more potent than carbon dioxide
- Survives in the atmosphere for up to 150 years
- Represents 9% of all greenhouse gas emissions
- Agriculture, waste and water treatment industries account for 80% of  $N_2O$  greenhouse gas emissions

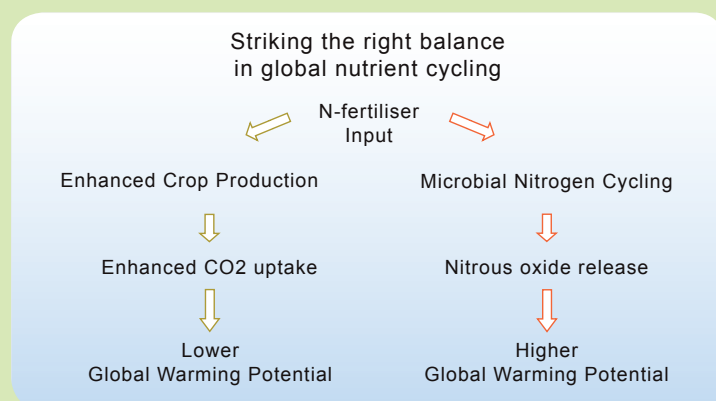


## The Nitrogen Cycle

When faced with a shortage of oxygen many bacterial species, are able to switch from using oxygen to using nitrates to support respiration in a process known as denitrification, during which the water-soluble nitrates are converted into gases, including nitrous oxide, that are emitted into the atmosphere.

Denitrification is central to the cycling of nitrogen in agriculture and has industrial applications in water purification and wastewater treatment. Consequently more than 80% of nitrous oxide emissions globally are associated with the agricultural and waste-treatment industries.

The below illustration shows the fine balance in nutrient cycling. Depending upon microbial status, the effects of nitrogen-containing fertiliser input may vary and greatly impact upon overall greenhouse gas emissions. Modelling this phenomenon could lead to the ability to predict when and why this might happen.



## Get Involved

If you are interested in the activities of the Nitrous Oxide Focus Group or want to discuss ways of working together please contact:

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Collaboration could include providing a letter of support, participating in activities or assuming an Advisory Board position and your organisation could benefit from:

- Access to cutting edge strategies, technology or innovation at the development stage.
- An opportunity to view and steer development of project outcomes.
- Find out how to exploit our Nitrous Oxide expertise and technical developments for the benefit of your organisation.
- An opportunity to champion adoption of strategies, technology or innovation in the wider community (beyond your corporate community), including your customer base.

